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A large part of the North American strata which have been by various authors referred to the Permian have no valid claim to be either so considered, or as being separate from the upper Coal-measures. But a part of them may be reasonably assumed to be homotaxially equivalent with at least a part of the European Permian; although their delimitation from the Coal-measures may in most cases be difficult or impracticable.

The evidence upon which the Texan strata have been referred to the Permian is fuller than that which has been adduced with regard to any other North American strata, that have been so referred. That is, the evidence of both vertebrate and invertebrate fossils is in favor of such reference, and the difference in the character of the strata from those of the underlying Coal-measures, although not great, is conveniently distinguishable. Still, it is true that the Texan Permian strata bear many Coal-measure invertebrate species; and its flora is at present unknown.

ON THE MAMMALIA OBTAINED BY THE NATURALIST EXPLORING EXPEDITION TO SOUTHERN BRAZIL.

BY E. D. COPE.

THE Naturalist Exploring Expedition left New York for Southern Brazil in the year 1882, and landed at Porto Alegre in the department of Rio Grande do Sul, with the object of making collections in that province.[1] It was under direction of Herbert H. Smith, whose former service under Prof. Frederick Hartt in the Geological Survey of Brazil, had given him ample acquaintance with the people and language. Regular collections were first made at the village of Sao Joao do Monte Negro, on a tributary of the Uraguay River, in the western centre of the province, in about lat. 28° south. After a residence there of several months, Mr. Smith and party proceeded north-west to the interior province of Matto Grosso, ascending the Paraguay River to Cuyaba. From Cuyaba the party went about thirty miles to the north-eastward, to the little village of Chapada, where they remained for months. This locality was especially favorable for the objects of the expedition, being on the boundary line between the great plains to the south and the forest-covered mountains on the north, and at the heads of the drainage of the Paraguay to the south, and of the Xingu tributary of the Amazon on the north, at about lat. 15° S.

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[1] Articles descriptive of this region by Mr. H. H. Smith will be found in the AMERICAN NATURALIST, 1883, pp. 480, 707 & 1007.

The difference in the characteristics of these localities is easily observable in the collections obtained from them. I have already published reports on the Batrachia and Reptilia from both localities,[1] and the present report embraces the Mammalia. The insects and birds are in the Museum of Natural History, Central Park, New York. Researches on the Mammalia of these regions have been already made by Hensel[2] and Von Jhring in Rio Grande do Sul, and by Natterer at Cuyaba. The collections of the last-named explorer are worthily described by Wagner of Munich, and a full report on them has been made by Von Pelzeln. ‡ of Vienna. Sixty-five species were obtained by Mr. Smith, most of them represented by many specimens, and five of the species appear to be new to science. The distribution of these as to locality will be stated at the close of the paper.

MARSUPIALIA.

1. DIDELPHYS MARSUPIALIS AZARÆ Temm. (Thos.)

Two skins with skeletons from Sao Joao; three skins with skeletons from Chapada; one skin with skull from Sao Joao; two skins from Chapada, two from Sao Joao, and four without locality; also one skeleton from Chapada, two skulls from do, three skulls from Sao Joao, and two skulls and a skeleton of unknown localities.

2. DIDELPHYS MARSUPIALIS AURITA Wied. (Thomas).

One skin from uncertain locality. Although fully grown, the long dorsal hairs and the ears are perfectly black, and there are large spots above the eyes. Belly light brown.

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[1] Proceedings American Philosophical Society, 1884, p. 185 ; 1887, p. 44.

[2] Memoirs of the Akad. Wissensch. Berlin 1872. ‡ Zoolog. Botan. Gesselsch. Wien, 1883.

3. PHILANDER PUSILLUS Desm.

A specimen in alcohol, and a skeleton, probably of this species, from Chapada.

The generic name Philander is used here for the opposums without marsupial pouch, without regard to other characters.

4. CHIRONECTES MEMINA Cuv.

One skin with skeleton from Chapada.

CHIROPTERA.

PHYLLOSTOMIDÆ.

5. PHYLLOSTOMA HASTATUM Pallas.

Chapada.

6. CAROLLIA BREVICAUDA Weid.

Chapada.

7. ARTIBEUS PLANIROSTRIS[1] Spix.

Chapada.

8. ARTIBEUS BILOBATUS Peters.

Neither of the two specimens from Chapada agree with the description given by Professor Peters in all respects. The edge of the lancet of the nose-leaf is not crenulate, and the border of the horseshoe is but slightly lobed. In all other respects the specimens agree with the descriptions. The degree of the lobing of the edge of the horse-shoe may be variable; and I observe some crenation of the edge of the same in some specimens of the *Vampyrops lineatus* which is wanting in other specimens.

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[1] DERMANURA EVA sp. nov.

Founded on two adult males from the Island of Saint Martins, West Indies.

Dentition, I.$\frac{2}{2}$; c.$\frac{1}{1}$; pm.$\frac{2}{2}$; m.$\frac{2}{2}$. Median upper incisors emarginate; all the inferior incisors emarginate. Lip tubercles as usual in this genus and Artibeus, those of the permaxillary region narrow and separated by vertical plicæ, and without an interior row of rounded warts as in *A. planirostris*. Inferior border of horseshoe free and not appressed, its lateral borders once undulate. Ear laid forwards reaching to middle of eye. Tragus acuminate, widest at the middle, triangular in section, the edge external. Interfemoral membrane notched to a line opposite to the middle of the tibia. Hind legs and feet, interfemoral membrane to line of knees, and proximal half of fore-arm, with a sparse silky fur. Wing membrane furred to middle of femur above and below. General color brown, reddish tinged on the limbs and head. Sides of head a pale shade, above each eye to inner side of ear, paler.

Length of head and body, m. .079; of interfemoral membrane to notch, .012. Length of head .032; of leaf of muzzle, .0125; of fore-arm, .059; of tibia, 021; of posterior foot, .017.

According to Dobson, this species approaches nearest to the *D. quadrivittata*, but it differs in its much superior size and in the different form of the external incisor tooth. It is as large as the *Artibeus planirostris*. Dr. R. E. Van Rijgersma.

9. VAMPYROPS LINEATUS Geoffroy.
Chapada.

10. STURNIRA LILIUM Geoffroy.
Chapada.

EMBALLONURIDÆ.

11. MOLOSSUS RUFUS Geoffr.
One specimen from Sao Joao.

12 NYCTINOMUS BRASILIENSIS Is. Geoffr.
Four specimens from Sao Joao.

VESPERTILIONIDÆ.

13. VESPERUS ARGE sp. nov.

Dentition I. $\frac{2}{3}$; c. $\frac{1}{1}$; Pm. $\frac{1}{2}$; m. $\frac{3}{3}$. Inferior incisors trilobate, placed transversely to the mandible; superior incisors unequal, the external simple, narrow, not quite so long as either lobe of the internal, and placed close to it and to the canine. "First" (second) inferior premolar much smaller than second, and in line with the latter. Ears much shorter than the head, when laid forwards reaching a short distance in front of eye, near the apex. Helix openly notched on the external margin, which is thus turned outwards and obtusely rounded. Tragus convex, separated from helix by a very open emagination. Antitragus elongate lanceolate, with the greatest width near the middle, and with a rounded lobe at the external base. Lateral swellings of the muzzle large, covered with sparse hair. At their anterior extremity and just above the nostril is a deep fossa which is connected by a groove with the nostril, giving the appearance when closed of an oblique slit-like nostril, as in *V. platyrhinus* of Dobson. No tubercles on the soles. Interfemoral membrane inclosing all the caudal vertebræ, which terminate in a short free catilaginous apex. Wing membrane to base of hallux. Calcaneum long; postacalcaneal lobe distinct, narrow. Tibia elongate. Fur extending on the wing membranes by a narrow border only above and below, not extending on interfemoral membrane. Antebrachial membrane not reaching middle of fore-arm.

Color above dark brown tinged with reddish; below similar, the hairs with lighter brown tips. Inferior side of interfemoral membrane pale or milky, the color becoming less decided towards the margins.

Length of head and body m. 061; of tail .038; of head .020; of hind foot, 010; of third digit, .071.

One [1] from Sao Joao.

EDENTATA.

MYRMECOPHAGIDÆ.

14. MYRMECOPHAGA JUBATA Linn.

Four skins with skeletons, and three skulls, from Chapada.

15. MYRMECOPHAGA BIVITTATA Desm.

Two skins with skeletons, and two skeletons and a skull from Chapada ; one fresh skin purchased at Sao Joao.

16. MYRMECOPHAGA BIVITATTA STRAMINEA sp. nov.

This species is represented by a nearly perfect skin in good preservation. Its proportions are much as in the *M. bivittata*, including the relative length of the tail. The internal claws are smaller than in the common species. The most obvious peculiarity is the color. This is a general straw-color, uninterrupted excepting by two black bands on the shoulders, and a black patch on the middle of the abdomen. The black bands commence immediately in front of the shoulders, and extend posteriorly over them, and terminate above a point about an inch posterior to the axillæ, converging very slightly, or nearly parallel. A blackish band passes from the eye, which it surrounds, to the muzzle. Claws dark horn-color.

Measurements of skin in normal proportions.

	M.
Length to base of tail (below)	.410
" of tail	.365
" from end of muzzle to eye	.055
" " " " to ear	.095
" of ear	.028
" of fore leg	.153
" of second claw (chord)	.016
" of third claw (chord)	.037
" of hind leg	.150
" of sole of hind foot (exclusive of claws)	.069
" of posterior fourth claw	.015

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[1] In a cave near Chapada, Mr. Smith found skulls of species of bats of the genera Molossus, Phyllostoma, and Chiroderma.

Burmeister (Thiere Brasiliens) refers to specimens of the *M. bivittata* in which the black of the dorsal regions is very much reduced in extent.

The type specimen is not fully grown I suspect. The label has been lost, so that I do not know whether it was obtained at Sao Joao or at Chapada.

17. MYRMECOPHAGA ?SELLATA [1] Cope.

A skin from Chapada resembles almost exactly this species or sub-species, in coloration, differing only in the non-continuation of the median yellow dorsal stripe to the yellow of the rump. But unfortunately it lacks the end of the tail so that the length of this part cannot be ascertained. I therefore refer it here with doubt.

Two specimens from French Guiana are in the Museum of the Academy of Natural Sciences in this city. They are grizzled straw-color, and have no black bands or spots. The hair of the entire superior regions is black at the base. The tail, is as long as the head and body together. These animals I suppose to belong to the *M. longicaudata* of Schreber, but the tail is not twice as long as the body as Gray states, but as long as the head and body, as in the *M. sellata*, and considerably exceeding that of the *M. bivitatta*.

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[1] MYRMECOPHAGA SELLATA sp. nov.

This species is founded on a skin which I obtained from Dr. Fritzgaertner, who brought it from Honduras and displayed it in the exhibit from that country at the World's Exposition at New Orleans. It is characterized by its long tail and peculiar coloration, exhibiting characters between the *M. longicaudata* of Wagner and the *M. bivittata*. While the tail is as long as the body in the latter, it is said to be nearly double that length in the former. In the *M. sellata* it is at least equal to the head and body together, but as the extremity is wanting it may have been longer. The hairs on the extremity of the tail are very sparse.

The color is characteristic. The ground is straw-color. An oblique black band commences on the front of the upper arm and extends upwards and backwards over the shoulder, and converges rapidly towards its fellow. They do not, however, meet, but each is continuous with a large black patch which covers the back and sides on each side of a narrow median band of the light ground-color. These patches extend posteriorly above to the end of the lumbar region, and then the boundary runs obliquely forwards on each side to the groin. This leaves the thighs, rump and tail of the pale ground color, regions which are black in the *M. bivittata*. The dusky color in front of the eye is very indistinct. The feet and end of the muzzle have been unfortunately cut off from this specimen, so that their characters cannot be ascertained. The length of the body to the base of the tail is 0.400 m. ; length of tail, .515 m.

Besides the three skins above mentioned, there are two of the *M. bivittata* in the Museum of Philadelphia, one from the Magdalena River, and one from Brazil.

DASYPODIDÆ.

18. XENURUS GYMNURUS, Illiger, 1815.

Three skins, with skeletons, one from Sao Joao, and one from Chapada.

19. XENURUS HISPIDUS Burmeister.

Twelve individuals, all from Chapada: evidently abundant, and constant in its characters.

20. DASYPUS SEXCINCTUS Linn.

Two skins, five skeletons, and nine skulls, all from Chapada.

21. PRIODONTES MAXIMUS Kerr.

One individual complete, and one skull from Chapada.

22. TATUSIA PEBA Desm.

Two skins, with skeletons, from Sao Joao; one skin with skull, four skeletons and nine separate skulls, all from Chapada.

23. TATUSIA MEGALOLEPIS sp. nov.

Movable bands, six; transverse bands or rows on the scapular shield, counted near the border, and omitting the large posterior row, twelve. Transverse rows on the pelvic shield, counted near the border, twelve, without the anterior wide marginal row. Tail considerably shorter than body, cylindric to the end. No rudimental thumb on the forefoot. Ears one-third as long as head. Two short hairs issuing from each scute of the movable rings. Hair of inferior surfaces very sparse.

Measurements.

	M.
Length of carapace (axial)	.197
" of shield of head	.055
Width between orbits	.026
Length of ear	.025
" of tail	.166
" of fore leg	.052
" of third claw of fore foot (fourth)	.017
" " " hind foot	.012

The large size of the scales distinguishes the *Tatusia megalolepis* from the *T. peba* and the *T. hybrida* at all ages. The number of scuta in a movable band in the former is only 43, while in both the latter the number ranges from 57 to 60. It resembles the *T. hybrida* in the short tail, but differs from this species in its longer ears, which are quite as in the *T. peba*, and also in the rounded and not angulate posterior border of the head shield, with one and not two rows of scales. The skull displays some slight differences from that of the *D. peba*. One character appears to be of value. The pterygoids are produced towards the median line, so that their opposing edges are parallel and separated by a fissure only, and this fissure is continued on the middle line into the palatine bone for a distance of nearly 2 mm. In all of my numerous skulls of *T. peba*, the pterygoid borders are either divergent or are separated by a wide space, and the palatines are not notched posteriorly. The palate is flat, with the borders rounded, and not recurved.

A single specimen with skeleton from Chapada.

RODENTIA.

SCIURIDÆ.

24. SCIURUS ÆSTUANS Linn.

One skin with skeleton, one with skull, and one entire skeleton, from Sao Joao.

25. SCIURUS VARIABILIS Geoff. var *Langsdorffii* Natt.

Four skins with skeletons, four skins with skulls, nine separate skins, and four separate skulls, all from Chapada.

Mr. J. A. Allen refers the *S. langsdorffii* of Natterer to this species as a color variety. All of the above seventeen skins are identical in color, showing that if it is but a variety, it is very constant in this locality. I may add that of the eleven skulls of the collection, all have but one superior premolar, and not two as given by Mr. Allen for the S. *variabilis*.

MURIDÆ.

26. CRICETUS sp.
Chapada.

27. CRICETUS sp.
Chapada.

28. CRICETUS sp.
Chapada.

29. CRICETUS sp.
Sao Joao.

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[1] Report U. S. Geol. Survey Terrs. XI, p. 768.

30. MUS ALEXANDRINUS Geoffr.

Chapada. With a litter of young.

31. MUS DECUMANUS L.

Sao Joao.

ECHINOMYIDÆ.

32. DACTYLOMYS AMBLYONYX Wagner.

Three skins with skeletons, from Sao Joao.

These specimens agree with the descriptions given by Hensel and Burmeister. The dentition differs from that of the *D. typus* Geoff. as figured by Geoffroy [1] and F. Cuvier,† in having the two component V-shaped columns in both jaws united by a narrow isthmus, as is the case in the columns in Echinomys. This fusion is probably due to the age of the specimen, as it takes place on wearing in the genus Echinomys. Another character is the transverse lamina-like anterior plate of the first inferior molar (premolar), which is represented by a cylindric column in the *D. typus*, according to the authors cited. The superior molars are not nearly so close together anteriorly as is represented by St. Hilaire to be the case in the *D. typus*, and they diverge a little posteriorly.

HYSTRICIDÆ.

33. SPHINGURUS PREHENSILIS Linn.

Three skins with skeletons, and one skull, from Chapada.

34. SPHINGURUS SERICEUS sp. nov.

All the inferior surfaces with the forearm and lower leg destitute of spines, but clothed with a silky hair of which the basal half is black and the terminal half silvery white. Superior surfaces to the middle of the length of the tail, spinous ; the spines concealed by long silky hair except on the head, nape, and proximal half of the tail. This hair is much longer than that on the inferior surfaces, and is similarly colored, i. e., with the basal half black, and the terminal half silvery, but more inclining to gray than on the inferior surfaces. The spines are an inch and a half long, becoming shorter on the tail, the front, and the upper lip, and are rather slender, and on the nape are decurved. Those on the interorbital and suborbital regions are still more slender. The nasal, preorbital, and subcaudal regions are covered with rather stiff hairs, the latter becoming silky towards the end of the tail.

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[1] Geoffroy St. Hilaire, Nouv. Ann. du Museum I, 450 pl. XVIII, fig. 3 ; Is. Geoffr., Magaz. de Zoologie, 1840, p. 27, pl. XXVIII, figs. 1–3. † Dents des Mammifers.

The spines are generally black on their basal half, and sulphur yellow on their terminal half, without other color on the apex. Those of the interorbital, suborbital and prescapular regions, are white, with a black space at the middle, and the base of the spines is also white below the black on the posterior regions of the body, and on the tail. The hairs covering the basal half of the tail below are yellow; those covering the terminal half are black. End of muzzle projecting beyond mouth, covered with minute silky hairs. Whiskers long, black.

Measurements of skin.

	M.
Total length	.665
Length from end of muzzle to vent	.395
" " " " orbit (on axis)	.020
" of fore limb	.130
" " foot on sole (total)	.045
" " claw (third)	.020
" of hind limb	.135
" " foot on sole (total)	.063
" of third hind claw	.018

Measurements of skull.

	M.
Total length on base	.073
Length to line of orbits (axial)	.022
Interorbital width	.026
Length of palate from incisors	.032
Width of palate below m. iii	.010

In the determination of this species I have had before me in the museum of the Academy of Natural Sciences, three specimens of *S. villosus* Cuv. (*S. insidiosus* Licht.), and one each of the *F. melanurus* Natt., and the *S. nychthemerus* Licht. These render it evident that the only species with which it is necessary to compare the *S. sericeus* is the *S. affinis* of Brandt, which I have not seen. That animal is described as being brown above and below, instead of silvery white, and in having the spines brown tipped. The humeral spines are exposed, which they are not in the *S. sericeus*. It is said to have a postorbital process of the malar bone. This is wanting in the *S. sericeus* (two skulls).

The *S. sericeus* was probably included by Mr. Hensel in the

S. villosus in his memoir on the Mammalia of Southern Brazil.[1] He refers to such variations of color and length of hair, as will embrace both species. Should his species not be separable from the *S. villosus,* then the *S. melanurus* and *S. nycthemerus,* must be also united with the latter.

The entire absence of all brown color from the hair and spines of this species, and their replacement by silver white and sulphur yellow, gives it a very distinct appearance.

CAVIIDÆ

35. CŒLOGENYS PACA Linn.

One skin with skeleton from Sao Joao; one skin with skeleton from Chapada, and two skulls without locality.

36. DASYPROCTA AZARÆ Licht.

Six skins with skeletons from Chapada; one skin with skeleton from Sao Joao; four skins with skulls from Chapada; one skin from Chapada without skull; one do, from Sao Joao; two skeletons without skins from Chapada, and one from Sao Joao; and eight skulls without skins from Chapada; total twenty-five individuals.

The single skins from Sao Joao have the inferior surfaces of a deeper yellow than those from Chapada, and the hair of the rump is less tinged with gray and more with yellow, than in the latter.

37. DASYPROCTA AUREA sp. nov.

This species is represented by but a single perfect skin in excellent condition, from Chapada. It is superficially most nearly related to the *D croconota* and *D prymnolopha* of Wagler, and represents them in Southern Brazil. The species is of about the size of the *D. azarae* and resembles it in general proportions. The ungues are, however, shorter, as is also the sole. In color it is peculiar. The hairs are uniform orange yellow on all parts of the body, paler at the base. There is no crest of long hair on the nape as in *D. prymnolopha,* but the hair of the rump is elongate, and rather paler in color than on other parts of the body. The top of the head is a little darker than the back, having a rufous tinge. The anterior faces of the feet are similar to the top of the head. The belly is a little paler than the back, but not so pale as the rump. Soles and claws yellowish horn color. The ears are rather sparsely haired. The tail is very short, as in the *D. azarae.*

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[1] Memoirs of the Akademie der Wissenschaften of Berlin, 1872, p. 56.

In the following measurements some allowance must be made for stretching of the skin.

Measurements of skin.

	M.
Total length	.660
Length of tail	.010
" from end of muzzle to orbit	.067
" " " " to ear	.113
" " " " to axilla	.273
" of fore leg	.142
" " foot below	.032
" of hind leg	.165
" " foot below	.103

This species seems to be nearer to the *D. croconota* than to the *D prymnolopha.* Unfortunately I can find no skeleton or skull pertaining to the type, so that I can not describe their characters. It is much larger than the former species, exceeding it by more than six inches. Its uniform coloration is also entirely peculiar in the genus, for the hairs are not annulated. The feet are relatively much shorter than in the *D. croconota;* for according to Waterhouse, with a total length of 17 in. 9 lines, the feet of the latter measure (minus the nails) 3 in. 5 lines which is identical with the length of the foot in *D. aurea,* with a total of twenty-four inches. The head is the *D. croconota* measures 3 in. 11 lines. The relationships of the *D. rarea* appear to be with the *D. azaræ.*

38. HYDROCHŒRUS CAPYBARA Erxl.

Four skeletons, one with a skin and a separate skull, all from Sao Joao.

39. CAVIA APEREA Erxl.

Four skins, three with skeletons, from Sao Joao.

LEPORIDÆ.

40. LEPUS BRASILIENSIS Linn.

Two skins with skeletons; three skins with skulls; six separate skins, and four separate skulls; all from Chapada.

CARNIVORA.

CANIDÆ.

41. CANIS CANCRIVORUS Desmarest.

Three skins with skeletons; one skeleton without skin, and one skin without skeleton, all from Chapada.

42. CANIS VETULUS Lund.

One skin with skeleton, and one separate skull, from Chapada.

43. CANIS ENTRERIANUS, Burmeister, Reise durch die La Plata Staten 1865, II, p. 400.

Two skins with skeletons, and one skin with skull, all from Sao Joao, Rio Grande do Sul.

I am not as certain of the identification of this species as I would wish, and find it easier to determine what it is not than what it is. It differs from the preceding two species as follows :

C. cancrivorus ; Mandibular angle robust, truncate; posttympanic process adherent to bulla ; larger ; sectorial teeth relatively larger.

C. vetulus; mandibular angle slender, acute; posttympanic process adherant to bulla; smaller; sectorial teeth relatively small.

C. entrerianus; mandibular angle slender; acute; posttympanic process well posterior to bulla, but connected at base; larger; sectorial teeth relatively large.

This supposed *C entrerianus* agrees closely in general characters with the *C. griseus*, Gray, described by Burmeister [1] excepting in the superior size. It agrees in dimensions with the *C. azarae Cuv.* but differs from both that species and the *C magellanicus* Gray, in the possession of but one inferior premolar tooth with posterior cutting lobe instead of two. It also differs from both these species, and agrees with the *C. griseus* in the wide separation of the premaxillary and frontal bones. The general color is reddish, the hair on the anterior regions above, yellow near the tips, and brown at the tips, the brown becoming blackish on the posterior regions and the tail. Limbs light clean rufous; soles reddish brown. Belly and neck white, a gray band crossing just in front of the breast. Chin black except at tip, which is white. Upper surface of ears (which are large) bright rufous. The animal is at least as large as the red fox. The coloration differs from that of *C. griseus* only in not showing the two white spots on the throat as described by Burmeister.

MUSTELIDÆ.

44. GALICTIS VITTATA Schreb.

Three skins with skeletons from Sao Joao.

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[1] Erlaüterungen zur Naturgeschichte Brasiliens, 1856, p. 48.

45. GALERA BARBARA Linn.

Five skins with skeletons from Chapada.

46. LUTRA PLATENSIS Burmeister.

A skin and skeleton from Sao Joao ; do. from Chapada ; do without locality.

A comparison of the skulls of this species with two of *Lutra canadensis* in my collection, and three in that of the Academy of Natural Sciences, show the following differences. The palate is not so much produced posterior to the molar teeth : the superior tubercular molar has smaller anteroposterior diameters, especially at the interior extremity; and there is no preglenoid crest. The length of the skull is 103 mm., and the total length of the same individual is 1200 mm.

PROCYONIDÆ.

47. PROCYON CANCRIVORUS Cuvier.

Black-footed variety, Sclater, Proceedings Zool. Soc., London, 1875, p. 421.

One skin with skeleton of a male, and a separate skull ; both from Sao Joao.

The skin is that of an adult male in excellent condition. The hair is dense and woolly on the body, but is very sparse on the anterosuperior faces of the feet. The tail is fusiform and bushy. The fundamental color is brownish-yellow above, but the hairs on the middle region of the back have long black extremities. The color below is light brownish yellow. The feet are all black up to the midde of the tibia and forearm. The tail is black, crossed by five annuli of yellowish brown.

For comparison with the skulls of this species I have eight of the *P. lotor* and two of the *P. hernandezii.* Of the former, one is from New York, and one from Pennsylvania ; of the latter, one is from S. W. New Mexico, and one from Western Oregon. The characters of the *P. cancrivorus* are easily observable ; while those of the two other species are also visible. I compare them in the following table :

I. Canines less compressed ; metaconid of P. m. I. often present.
Postdental part of palate wider than long ; malar bone weak ; front narrow, width equal diameter of orbit ; each nasal bone obliquely truncated ; larger.
P. cancrivorus.

Postdental part of palate as wide as long; malar bone very robust; front wide, flat, exceeding diameter of orbit; each nasal bone truncate with produced outer angle. *P. hernandezii.*

Postdental part of palate longer than wide; malar bone robust; front narrow, convex, width equal that of orbit; each nasal bone deeply emarginate distally.......*P. lotor.*

II. Canines much compressed; metaconid of P. m. I. always wanting.

Muzzle shorter; palate angularly elevated posteriorly; last inferior molar wider, heel median; larger...*P. nasicus.*

Muzzle longer; palate nearly flat posteriorly; last inferior molar narrower, the heel internal; smaller.......*P. nasua.*

In the two specimens of *Procyon cancrivorus* before me the metaconid of the p. m. 1. is well developed. In the *P. lotor* it is distinct in four out of eight skulls, and is represented by a mere trace in the other four. In a single *P. hernandezii* a trace only is visible. The form of the free extremity of the nasal bone is not constant in these species, and that of the last inferior molar will bear further examination.

The question is raised by Dr. P. L. Sclater, as above cited, as to whether the southern black-footed raccoon is specifically identical or distinct from the rufous-footed form from Surinam and Central America. In the lack of specimens of the latter region I cannot give a definite answer to this question.

In the skull of the *P. hernandezii*, above described, the *processus pyramidalis* of the palate has on its external face, a deep groove, bordered above and below by an alate crest, which are wanting in the *P. lotor*. The malar bone is also produced downwards at its inferior border next the maxillary, and the postorbital processes of the frontal and malar bones are both more distinct than in the *P. lotor*. Whether these are individual characters or not I cannot now determine.

48. PROCYON NASUA Linn. *Nasua rufa* Desm. Allen.

Three skins, with skeletons, all from Sao Joao.

49. PROCYON RUFUS Desmarest.

Twenty skins, three with skeletons, and one with a skull; seventeen separate skulls and eleven skeletons, all from Chapada.

The skins of the Coatis from the two localities, differ constantly and essentially, so that there appears to me to be two species, or, perhaps, subspecies. The most important difference is in the shape of the naked part of the nose. In the *P. nasua* from Sao Joao, in each of the three specimens, this region is not longer than wide above, and is wider than deep below, being separated by a broad band of hair from the lip border. In the *P. rufus* this region is constantly at least twice as long as wide above, and much deeper than wide below, with an angular outline which approaches near to the lip border. In the *P. nasua*, the white on the upper lips is wide and conspicuous, and the cheeks and top of head are of a light gray or pale brown. The top of the nose is light except at the end, and the median head stripe when present is of a darker color than the top of the head. In the *P. rufus* the white line on the upper lip is very narrow or wanting, and the head is generally blackish gray, the color of the vertex continued on the middle line to the black of the top of the nose. In the *P. nasua* the general color is light brown or gray ; below light yellowish brown. Less than half the leg is black. In the *P. rufus* the back is dark rufous, the hairs generally shortly, sometimes deeply, black tipped : belly and throat bright rufus, except the white chin. More than half the legs black.

The colors of these specimens are as constant as the different character of the naked nasal surfaces, and the resulting appearance is that of two species. The specimens of the *P. nasua* appear larger and more robust than those of the *P. rufus.* I cannot detect any difference in the skulls and teeth; there being no osseous character corresponding to the different proportions of the external nasal organs in the two species.

I find the characters pointed out by J. A. Allen[1] to distinguish the two Brazilian species from the Mexican, to hold good.

CERCOLEPTIDAE

50. CERCOLEPTES CAUDIVOLVULUS Pallas.
A skull from Chapada.

FELIDÆ.

51. UNCIA ONCA Linn.
One skin with skeleton, and three skulls, from Chapada.

52. UNCIA CONCOLOR Linn.
One skull from Chapada.

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[1] Bulletin of the U. S. Geolog. Survey of the Terrs, 1879, vol. v, p. 161.

53. FELIS PARDALIS Linn.

One skin from Chapada.

54. FELIS GEOFFROYI D'Orbigny.

One skin with skeleton from Chapada, and a skin with skeleton from Sao Joao.

55. FELIS JAGUARONDI Lacep.

One skin with skeleton from Chapada, and a skull from the same locality.

56. FELIS BRACCATA sp. nov.

Size of *F. jaguarondi.* Claws very small, white. Tail to end of vertebræ extending one inch beyond extended posterior limbs. Fur of irregular lengths, mingled everywhere with numerous long hairs. Color above brown, the hairs on the middle of the back, and on top of head and muzzle, with several black sections, which give a mixed black and brown hue to those regions. Upper portion of limbs of the same color, interrupted by black cross-bands, two on the fore leg and three on the hind, the former extending on the inner face as well. Distal half of all the legs black, without brown intermixture. Ears of moderate size with an apical angle a little less than right; the anterior half black, the posterior half gray. Inferior surface anteriorly furnished with long hairs of a buff color, which with short hairs of the same color near the anterior margin, show from above, giving a narrow brown border. Hair of the muzzle terminating in a straight transverse line which extends between the posterior parts of the nostrils. Lip whiskers long, buff with black bases. Some slender superciliary vibrissæ. A buff spot below each nostril, and a similar one above the anterior part of each eye. Cheeks yellowish brown, hairs black-varied.

Chin very pale buff. This color deepens posteriorly, soon passing into the yellowish brown of the lower surfaces. Numerous white hairs are scattered on the thorax and abdomen, and numerous deep brown spots form transverse series, which sometimes become bands, mark the same regions. Three cross-rows of brown spots appear on the throat, the most anterior consisting of two small lateral, and a large median spot, crossing below the ears. The spots become more indistinct on the sides, and are wanting on the inferior surface of the tail. The latter is colored like the back above, and is black at the tip.

Measurements of the relaxed skin.

	M.
Length from end of muzzle to vent	.467
" of tail from vent to end of vertebræ	.230
" of ear above	.017
Width between bases of ears	.052
Length from anterior base of ear to end muzzle	.052
" of fore leg	.195
" of fourth anterior claw	.006
" of hind limb (approximate)	.195
" " " from vent	.220
" of second posterior claw	.005

This cat is evidently more nearly allied to the *F. jaguarondi* than to any other known species, and I need only point out the characters in which it appears to me to be distinct. The *F. jaguarondi* is evidently subject to considerable variation, but none of its forms approach sufficiently near to the *F. braccata* as to lead one to believe in the identity of the two. I have before me the skin of the *F. jaguarondi* above referred to from Chapada.

In what might be called structural differences I note the following. The feet of the *F. braccata* are smaller than those of the *F. jaguarondi*, and the toes are of more equal length. The claws are very much smaller. Both the internal and external toes are relatively considerably shorter on both limbs in the *F. jaguarondi* than in *F. braccata.* The fourth anterior and second posterior claws of the former species measure 6 and 5 *mm.* respectively; in the latter they measure 11 and 13 *mm.* respectively. The tail is rather shorter in the *F. braccata*, being less than the length of the body from the axilla to the vent, and only an inch in excess of the posterior legs extended posteriorly. The tail in the *F. jaguarondi* equals the body, and extends two inches beyond the limbs. This character may prove to be unimportant. Finally the ears in *F. jaguarondi* are broadly rounded; in *F. braccata* they are so prominently angular, as to present an apex rather less than a right angle. The fur of the muzzle has a truncate border, while in the *F. jaguarondi* the border presents an acute angle forwards, as it follows the superior outline of the nares above.

The differences in color are as follows:

The upper surfaces of the ears are like the top of the head in *F. jaguarondi;* in *F. braccata* they are of two colors in strong contrast, and both different from that of the head. In *F. jaguarondi* the inferior surfaces are like the superior ; in *F. braccata* they are totally different, resembling various spotted cats. The legs are colored on the upper surface like the back in *F. jaguarondi*, and are black below; in *F. braccata* they are cross banded proximately, and the distal halves are totally black.

The aggregate of characters indicates the specific difference of the *F. braccata* from the *F. jaguarondi.*. The only approach to any of the peculiar characters of the *F. braccata* in descriptions of the *F. jaguarondi*, which I can find, is in that by Mr. Alston in the Fauna Centrali-Americana, who states that there are transverse bars on the *inside* of the legs.

It is to be much regretted that the label belonging to this specimen has been lost. I do not know therefore whether it was obtained in the province of Rio Grande do Sul, or in Matto Grosso.

DIPLARTHRA.

TAPIRIDÆ.

57. TAPIRUS AMERICANUS Briss.

One skin with skeleton from Chapada.

HIPPOPOTAMIDÆ.

58. DICOTYLES LABIATUS Cuv.

One skin with skeleton from Chapada; six skins from Chapada; one skin from Sao Joao; two skulls from Chapada.

One of the skins from Chapada presents certain peculiarities. It is not larger than the *D. tajassu*, and the bristles are longer and denser along the back, and especially on the rump, than in the other skins. The dirty white or yellowish part of the hairs is replaced by red-orange, giving the animal a fiery tint when the bristles are erected. It was labelled "red-pig" by Mr. Smith. Unfortunately its skull was not preserved. It does not appear to me to represent anything but a slight variety; perhaps it is a young male. In all the characters of the feet, muzzle, etc., it agrees with the *D. labiatus.*

59. DICOTYLES TAJASSU Linn.

Two skins with skulls from Chapada ; two separate skins from do.; three skeletons from do.; thirteen skulls, do.; one skull from Sao Joao.

On comparing the sixteen skulls from Southern Brazil with five skulls in my collection, and one in the Museum of Princeton College, from Texas, I find such constant and important difference as to satisfy me that the two forms cannot be regarded as specifically identical. Their differences may be compared as follows :

D. tajassu. Malar crest terminating above infraorbital foramen ; nasal bones rounded in cross-section ; first superior premolar (fourth of old works) tritubercular or rounded in outline, premolariform ; molars not wrinkled.

D. angulatus sp. nov. Malar crest continued forwards to base of canine alveolus ; nasal bones pinched or angulate on the middle line ; first superior premolar quadritubercular, with intermediate tubercles, and quadrate in outline, molariform ; molars wrinkled.

The characters cited are constant, although the amount of angulation of the nasal bones in the *D. angulatus* is subject to some variation. Another character, generally constant, is the form of the fossa above the diastema. In *D. tajassu* it is a narrow groove ; in *D. angulatus* it is a wide fossa. On comparing two Texan skins with five from Brazil, I notice but one distinctive character. The naked spot on the rump is very much larger on the former, and it is followed by a large patch of brown hairs, forming a distinct spot. In the *D. tajassu* the brown hairs exist, but in smaller numbers, and they are completely covered by the black hairs which are mixed with them. The feet have been cut off from my Texan skins, and those of other specimens are in skeleton, so that I cannot compare the hoofs. The Texan skulls average larger in dimensions than those from Southern Brazil.

The characters of the first premolar, and of the dentition generally, are well represented by Professor Baird, but the prolongation of the malar angle and the roof-shaped nasal bones are not very clearly expressed in the outline figures he has given.[1] His specimens came from the Rio Grande. Mine are, one from the Guadalupe R., two from the Llano R., and two from a tributary of the Red River.

The character of the first premolar in the *D. angulatus* approximates it to the *D. nasutus* Leidy.

CERVIDÆ.

60. CARIACUS CAMPESTRIS F. CUV.

One skin with skeleton ; three skins, and three skulls ; all from Chapada.

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[1] U. S. Mexican Boundary Survey, Pl. xxvii.

61. COASSUS RUFUS F. Cuv.

One skin with skeleton: one skin with skull; two skulls with skin of head, and six separate skulls, all from Chapada.

62. COASSUS SIMPLICICORNIS Illiger.

One skin with skeleton; one skin with skull; three skins and three skulls, all from Chapada.

QUADRUMANA.

CEBIDAE.

63. MYCETES SENICULUS Linn.

Very abundant at Sao Joao do Monte Negro. Varying in color from bright rusty red, to brownish black with dark rusty crown. No specimens from Chapada.

64. MYCETES BELZEBUL Linn.

Three specimens from Chapada Matto Grosso. The skull of this species does not differ from that of the last. The hair differs, especially on the head. It is procumbent and radiates in all directions from a point on the middle line posterior to the ears. It points directly forwards on the crown and front to the base of the nose, and anterior eyebrows, when it is met by hair directed upwards and backwards, forming a low tranverse elevation bordering the front, much as described by Slack in the *M. niger*. In the *M. seniculus*, the hair of the crown is erect and woolly from front to rear.

65. CEBUS CIRRHIFER. G. St. Hilaire.

One adult (female) from Sao Joao.

66. CEBUS ELEGANS G. St. Hilaire.

Abundant at Chapada. In the males there is generally a low sagittal crest, the glabella is swollen, and the frontal profile is convex. In the females there is no sagittal crest, the glabella is less swollen and the front is less convex. In the specimen above referred to, the *C. cirrhifer*, the characters of the skull are like those of the female *C. elegans*, but the front is flatter in profile.

SYNOPSIS.

The species obtained by the Naturalist expedition are distributed as follows, as to numbers and localities:

	Total.	Sao Joao.	Chapada.
Marsupialia..................	4	1	4
Chiroptera......	9	3	6

Rodentia....................	17	9	10
Edentata....................	9	3	9
Carnivora....................	16	6	12
Diplarthra....................	6	2	6
Quadrumana....................	4	2	2
	65	26	49

In the following lists the species of Sao Joao and Chapada are compared :

SAO JOAO.	CHAPADA.
MARSUPIALIA.	
Didelphys marsupialis azaræ.	*Didelphys marsupialis azaræ.*
" " *auritus*	
	Philander pusillus.
	Chironectes memina.
EDENTATA.	
	Myrmecophaga jubata.
Myrmecophaga bivittata.	" *bivittata.*
	" *? sellata.*
Xenurus gymnurus.	*Xenurus gymnurus.*
	" *hispidus.*
	Dasypus sexcinctus.
	Priodontes maximus.
Tatusia peba.	*Tatusia peba.*
	" *megalolepis.*
RODENTIA.	
Sciurus æstuans.	*Sciurus variabilis.*
Cricetus sp.	*Cricetus* sp.
	Cricetus sp.
	Cricetus sp.
Dactylomys amblyonyx.	
Sphingurus sericeus.	*Sphingurus prehensilis.*
Cœlogenys paca.	*Cœlogenys paca.*
Dasyprocta azaræ.	*Dasyprocta azaræ.*
	" *aurea.*
Hydrochœrus capybara.	
Cavia aperea.	
	Lepus brasiliensis.
CHIROPTERA.	
	Phyllostoma hastatum.
	Carollia brevicauda.
	Artibeus planirostris.
	" *bilobatus.*
	Wampyrops lineatus.
	Sturnira lilium.

Desmodus rufus.	
Nyctinomus brasiliensis.	
Vesperus arge.	
CARNIVORA.	
Canis entrerianus.	*Canis cancrivorus.*
	" *vetulus.*
Galictis vittata.	*Galera barbara.*
Lutra platensis.	*Lutra platensis.*
Procyon cancrivorus.	
" *nasua.*	*Procyon rufus.*
	Cercoleptes caudivolvulus.
	Uncia onca.
	" *concolor.*
	Felis pardalis.
Felis geoffroyi.	" *geoffroyi.*
	" *jaguarondi.*
	" *braccata.*
DIPLARTHRA.	
	Tapirus americanus.
Dicotyles labiatus.	*Dicotyles labiatus.*
" *tajassu.*	" *tajassu.*
	Cariacus campestris.
	Coassus rufus.
	" *simplicicornis.*
QUADRUMANA.	
Cebus cirrhifer.	*Cebus elegans.*
Mycetes seniculus.	*Mycetes belzebul.*

From the preceding lists, it appears that but ten species were procured at both localities. Of the thirty-one genera obtained at Chapada sixteen were found at Sao Joao. Of the twenty-three genera found at Sao Joao, sixteen were obtained at Chapada. Of especial peculiarity of the Sao Joao collection may be mentioned the absence of the water opposum, the tayra, the six banded and giant armadillos, and of all the leaf-nosed bats. Also the absence of most of the cats, including the jaguar; also the absence of the deer. The Chapada collection lacks the crab-eating raccoon, and the gray coati; the capybara and the wild guinea-pig ; and the bats of the families Emballonuridæ and Vespertilionidæ.